UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/555,614	11/04/2005	Daisuke Miura	03500.109594	4514

5514 7590 12/27/2007

FITZPATRICK CELLA HARPER & SCINTO
30 ROCKEFELLER PLAZA
NEW YORK, NY 10112

EXAMINER	
MALDONADO, JULIO J	
ART UNIT	**PAPER NUMBER**
2823	
MAIL DATE	**DELIVERY MODE**
12/27/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/555,614	MIURA ET AL.	
	Examiner	Art Unit	
	Julio J. Maldonado	2823	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 December 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-37* is/are pending in the application.

4a) Of the above claim(s) *11-36* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4 and 37* is/are rejected.

7)☒ Claim(s) *5-10* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *04 November 2007* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *02/12/2007, 01/09/2007*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of claims 1-10 and 37 in the reply filed on 12/12/2007 is acknowledged.

Drawings

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, a "layer composed of at least a polysiloxane compound, the layer being laminated on the organic semiconductor layer..." must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner,

the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

3. Claim 2 is objected to because of the following informalities: in claim 2, lines 3 – 9, where applicants recite, "...wherein the polysiloxane compound is represented...(In the formula, RI to R4 each represent a substituted or unsubstituted alkyl or alkenyl group having 1 to 5 carbon atoms, a substituted or unsubstituted phenyl group, or a siloxane unit. RI to R4 may be identical to or different from one another, n represents an integer of 1 or more.).", change to -- wherein the polysiloxane compound is represented...wherein R_1 to R_4 each represent a substituted or unsubstituted alkyl or alkenyl group having 1 to 5 carbon atoms, a substituted or unsubstituted phenyl group, or a siloxane unit, wherein R_1 to R_4 may be identical to or different from one another and n represents an integer of 1 or more--. Appropriate correction is required.

4. Claim 3 is objected to because of the following informalities: in claim 3, lines 2 – 23, where the applicants recite, "...wherein the polysiloxane compound comprises a polysiloxane compound represented by...(In the formula, R7 to R10 each represent a substituted or unsubstituted alkyl or alkenyl group having 1 to 5 carbon atoms, or a substituted or unsubstituted phenyl group. R7 to R10 may be identical to or different from one another, m and n each represent an integer of 0 or more, and a sum of m and n is an integer of 1 or more.)...(In the formula, R21 to R24 each represent a substituted or unsubstituted alkyl or alkenyl group having 1 to 5 carbon atoms or a substituted or unsubstituted phenyl group. R21 to R24 may be identical to or different from one

another. o and p each represent an integer of 0 or more, and a sum of o and p represents an integer of 1 or more.)...", change to --wherein the polysiloxane compound comprises a polysiloxane compound represented by...wherein R_7 to R_{10} each represent a substituted or unsubstituted alkyl or alkenyl group having 1 to 5 carbon atoms, or a substituted or unsubstituted phenyl group, R_7 to R_{10} may be identical to or different from one another, m and n each represent an integer of 0 or more and a sum of m and n is an integer of 1 or more...wherein R_{21} to R_{24} each represent a substituted or unsubstituted alkyl or alkenyl group having 1 to 5 carbon atoms or a substituted or unsubstituted phenyl group, R_{21} to R_{24} may be identical to or different from one another, o and p each represent an integer of 0 or more and a sum of o and p represents an integer of 1 or more--. Appropriate correction is required.

5. Claim 5-10 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot depend from any other multiple dependent claim. See MPEP § 608.01(n). Accordingly, the claims have not been further treated on the merits.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1-4 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aramaki et al. (U.S. 7,193,237 B2, hereinafter Aramaki) in view of Kelley et al. (U.S. 6,617,609 B2, hereinafter Kelley).

In reference to claims 1 and 37, Aramaki (Figs.1A-1D) teaches a field effect transistor having an organic semiconductor device comprising an organic semiconductor layer (1) containing at least porphyrin; and a gate dielectric layer (2) being laminated on or under the organic semiconductor layer (1) so as to be in intimate contact with the organic semiconductor layer (1), wherein said gate dielectric layer (2) is "...a material having an insulating property...such as polymethyl methacrylate, polystyrene, polyvinylphenol, polyimide, polycarbonate, polyester, polyvinyl alcohol, polyvinyl acetate, polyurethane, polysulfone, an epoxy resin or a phenol resin, a copolymer prepared by a combination thereof, an oxide such as silicon dioxide, aluminum oxide or titanium oxide, a ferroelectric oxide such as SrTiO.sub.3 or BaTiO.sub.3, a nitride such as silicon nitride, a dielectric such as a sulfide or fluoride, or a polymer having such dielectric particles dispersed therein, may be mentioned..." (Aramaki column 29, line 56 – column 30, line 40).

Aramaki fails to disclose wherein said layer having said insulating property is composed of at least a polysiloxane compound.

However, Kelly teaches an organic thin film transistor including an organic semiconductor layer and a dielectric layer adjacent to said organic semiconductor layer (Kelley, column 2, lines 50 – 59), wherein said organic thin film transistor further

includes a polysiloxane compound interposed between said organic semiconductor layer and said gate dielectric layer (Kelley, column 2, lines 60 – 63).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Aramaki and Kelley to enable a polysiloxane compound between the organic semiconductor layer and the gate dielectric layer of Aramaki as taught by Kelley because this would control the interface between the organic semiconductor film and the gate dielectric layer and thus improving the properties of said organic thin film transistor (Kelley, column 1, lines 41 – 46).

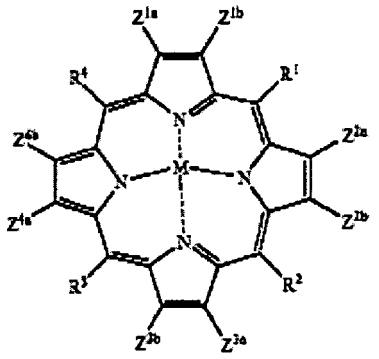
The combined teachings of Aramaki and Kelley fail to expressly disclose wherein said polysiloxane compound is a crystallization promoting layer. However, the same materials are treated the same way and therefore, the same result would be obtained. Therefore, the polysiloxane compound of the combined teachings of Aramaki and Kelley is labeled a crystallization promoting layer.

In reference to claims 2 and 3, the combined teachings of Aramaki and Kelley teach wherein the polysiloxane compound has the general formula $-(SiR_1R_2O)_n-$, "...wherein each R comprises, independently, a group selected from hydrogen, C.sub.1 -C.sub.20 aliphatic, C.sub.4 -C.sub.20 alicyclic, arylalkyl, or aryl, and a combination thereof which may contain one or more heteroatom(s) and/or one or more functional group(s). As used in this document, "heteroatom" means a non-carbon atom such as O, P, S, N and Si..." (Kelley, column 5, lines 11 – 32).

The combined teachings of Aramaki and Kelley fail to expressly disclose wherein the polysiloxane compound has the general formula $-(O\text{-}SiR_1R_2\text{-}O\text{-}SiR_3R_4)_n-$, $-(O\text{-}SiR_7-$

$O\text{-}SiR_8\text{-}O)_m\text{-}(O\text{-}SiR_9\text{-}O\text{-}SiR_{10}\text{-}O)_n\text{-}$ or $-(SiR21R_{22}\text{-}O)_o\text{-}(SiR_{23}R_{24}\text{-}O)_p\text{-}$. However, the polysiloxane disclosed in the combination of Aramaki and Kelley is open to have polysiloxane compounds with the claimed general formulas. Therefore, the combined teachings of Aramaki and Kelley inherently teach the claimed limitations.

In reference to claim 4, the combined teachings of Aramaki and Kelley teach wherein the porphyrin compound is represented by the general formula:



wherein each of Z^{ia} and Z^{ib} (i=1 to 4) represents a monovalent organic group, and Z^{ia} and Z^{ib} may be bonded to form a ring, wherein said monovalent organic group may, for example, be a hydrogen atom, a hydroxyl group, a $C_{1\text{-}10}$ alkyl group which may be substituted, an alkoxy group, a mercapto group, an acyl group, a carboxyl group or its ester with a $C_{1\text{-}10}$ alcohol, a formyl group, a carbamoyl group, a halogen atom such as fluorine, chlorine, bromine or iodine, an amino group which may be substituted by a C.sub.1-10 alkyl group, or a nitro group, and such a group may further have a substituent, wherein Z^{ia} and Z^{ib} are bonded to form a ring, the ring formed by the structure Z^{ia}—CH=CH—Z^{ib}, may, for example, be an aromatic hydrocarbon such as a benzene ring, a naphthalene ring or an anthracene ring, a heterocyclic ring such as a pyridine ring, a quinoline ring, a furan ring or a thiophene ring, or a non-aromatic cyclic

hydrocarbon such as a cyclohexene, wherein each of R^1 to R^4 is a hydrogen atom or a monovalent organic group such as an alkyl group which may be substituted, an aryl group, an alkoxy group, a mercapto group, an ester of a carboxyl group with a C_{1-10} alcohol, or a halogen atom and wherein M is a bivalent metal atom, such as Zn, Cu, Fe, Ni or Co, for example (Aramaki, column 10, line 46 – column 11, line 54).

Conclusion

8. Applicants are encouraged, where appropriate, to check Patent Application Information Retrieval (PAIR) (http://portal.uspto.gov/external/portal/pair) which provides applicants direct secure access to their own patent application status information, as well as to general patent information publicly available.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner Julio J. Maldonado whose telephone number is (571) 272-1864. The examiner can normally be reached on Monday through Friday.

10. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith, can be reached on (571) 272-1907. The fax number for this group is 571-273-8300. Updates can be found at http://www.uspto.gov/web/info/2800.htm.

Julio J. Maldonado
Patent Examiner
Art Unit 2823

Julio J. Maldonado
December 19, 2007

GEORGE R. FOURSON
PRIMARY EXAMINER